

# Ergonomics Program

# References

- NAVMC DIR 5100.8, Chapter 19
- OPNAVINST 5100.23G
- NIOSH PUB. NO. 97-117
- DODI 6055.1

# Overview

- ID Musculoskeletal Disorders
- Apply Engineering Controls
- Apply Administrative Controls
- Reduce Musculoskeletal Disorders
- Describe how to incorporate ergonomics into repair or replacement of tools, equipment or facilities

# What is ERGONOMICS?

- Matching the work place to the worker
- OSHA enacted the Ergonomics Program
- Why are we hearing about Ergonomics



# Two Broad Categories of Workplace Disorders

- Injuries:
  - cut, crush, or fall
- Illnesses:
  - repeated exposure to various substances, hazards, or environmental conditions

# Scope of Ergonomic Illnesses

- ***Cumulative trauma disorders*** (CTDs)
  - Repeated biomechanical stress
  - Damage to the tendons, tendon sheaths, related bones, muscles, and nerves of:
    - Hands, wrists, elbows, shoulders, neck, back.

# Scope of Ergonomic Illnesses cont.

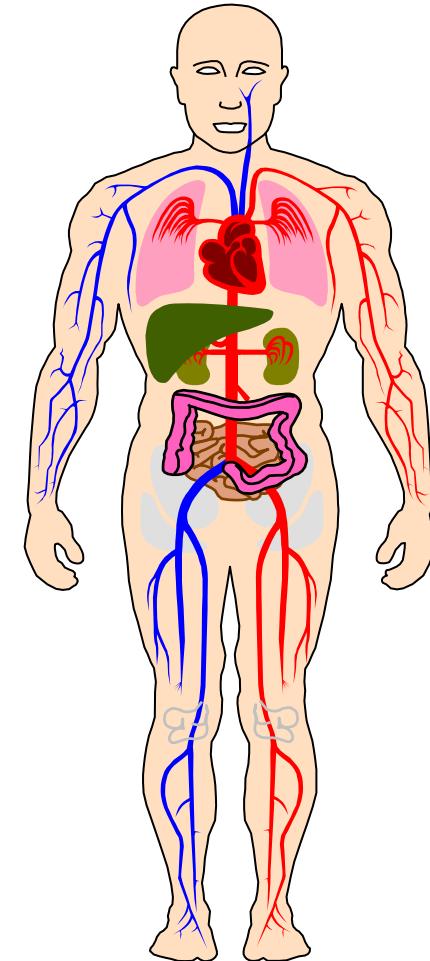
- ***Musculoskeletal disorders***  
(MSDs)
  - Neck, back, shoulder, elbow, hand, wrist, and fingers
  - Nerves, tendons, cartilage, ligaments, and muscles
  - MSDs can happen to anyone

# Scope of Ergonomic Illnesses cont.

- ***Work-related musculoskeletal disorders*** (WMSDs)
  - Caused by or made worse by the work environment
  - Affect or reduce performance capabilities

# Frequently Occurring Occupationally Induced Disorders

- Carpal Tunnel Syndrome
- Tendonitis
- Tenosynovitis
- Synovitis
- Stenosing Tenosynovitis  
of the fingers
- Low back pain



# Potential Indicators and Symptoms of CTDs

- Trends in accidents and injuries
- Incidents of CTD
- Absenteeism
- High turnover rate
- Working conditions noted by people with disabilities

# Potential Indicators and Symptoms of CTDs cont.

- Complaints about musculoskeletal pain
- High overtime and increased work rate
- Manual material handling/repetitive motion task
- Poor product quality

# Risk Factors

- ***Force***: physical effort required to maintain control of equipment or tools
  - perform heavy lifting, pushing, pulling, or carrying
- ***Repetition***: performing the same motion
  - prolonged typing, assembling components, and repetitive hand tool usage

# Risk Factors cont.

- ***Awkward postures***: positions that significantly deviate from the neutral position
  - working over-head, extended reaching, twisting, squatting, or kneeling
- ***Static postures***: holding a fixed position or posture
  - gripping tools that can't be set down
  - standing in one place for prolonged

# Risk Factors cont.

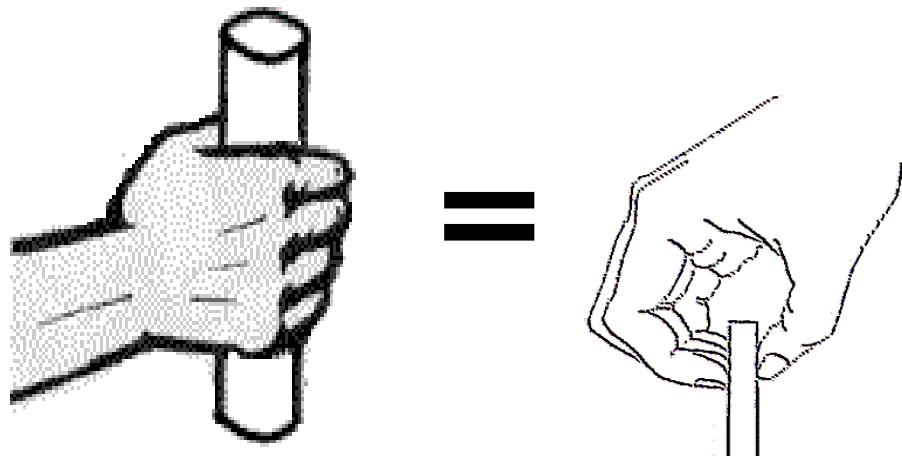
- ***Vibration***: specific part of the body comes into contact with a vibrating
  - chain saw, electric drill, chipping hammer, wood planer, punch press, or packing machine
- **Whole body vibration** occurs when standing or sitting in vibrating environments
  - driving a truck over bumpy roads or operating a jack hammer

# Risk Factors cont.

- ***Contact stress***: continuous contact between sensitive body tissues and hard or sharp objects

# Hand Force

A power grip can  
be 5 times stronger  
than a pinch grip



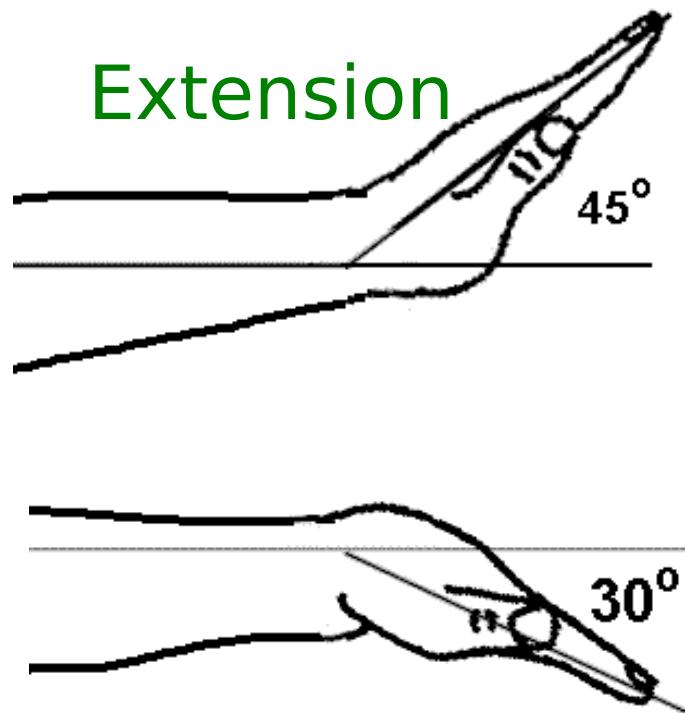
10  
lbs.

2  
lbs.

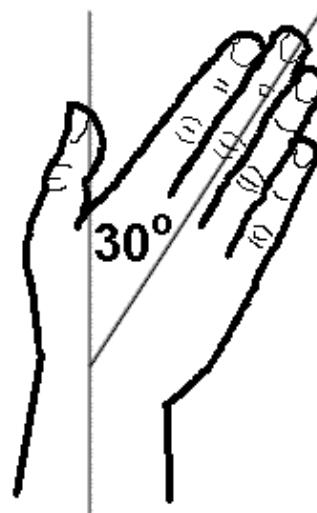
Takes 4.6 lbs. of  
force



# Wrist Bent



Flexion



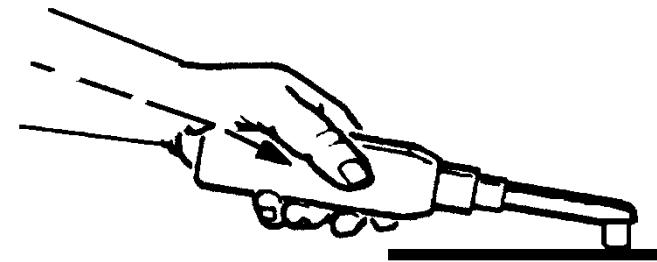
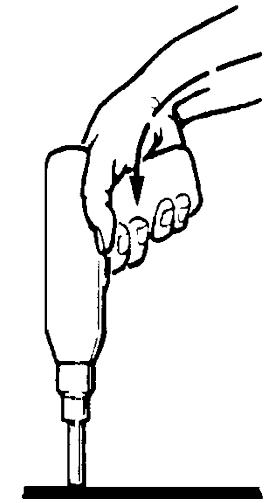
Ulnar deviation

# Tool Use

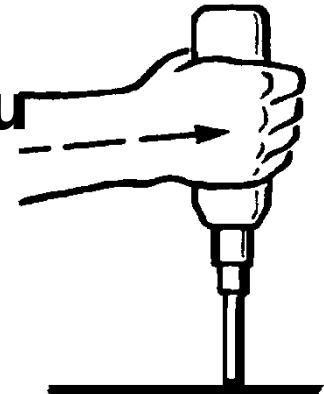
Handles get smaller, but hand does not



**Working with bent wrists decreases grip strength**



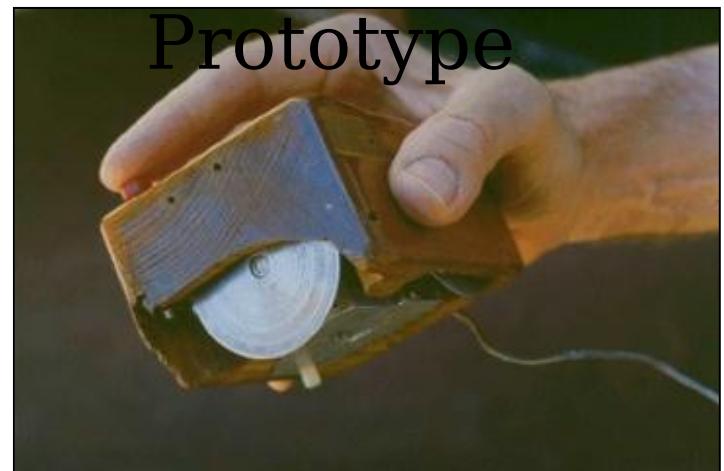
**Use tools that let you keep your wrist straight**



# Intensive Typing



The  
Prototype



# Repeated Impacts



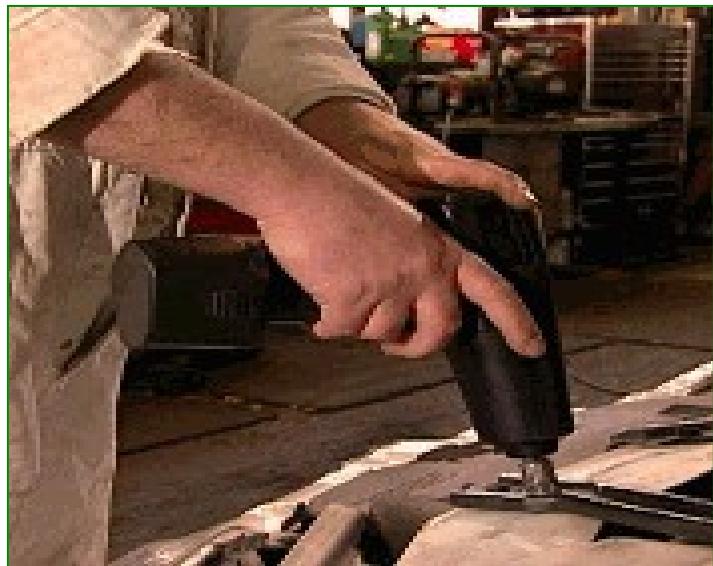
# Frequent, Awkward, or Heavy Lifting



# Vibration



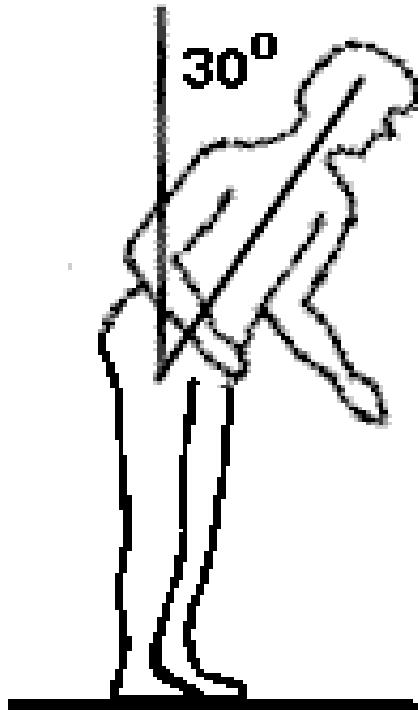
# Repetitive Motion



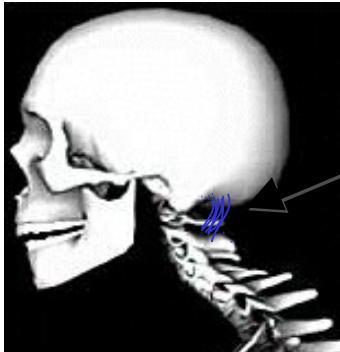
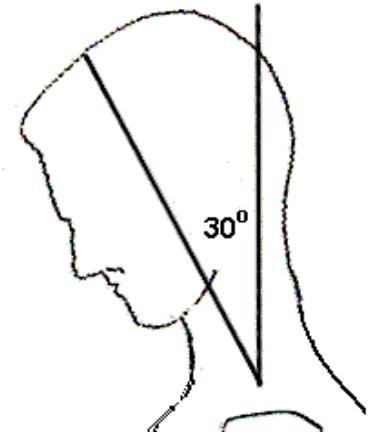
# Awkward Positions



# Back Bent More Than 30 Degrees

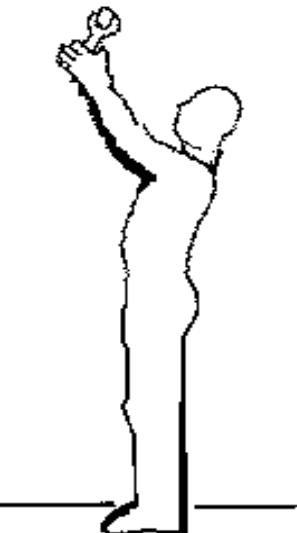
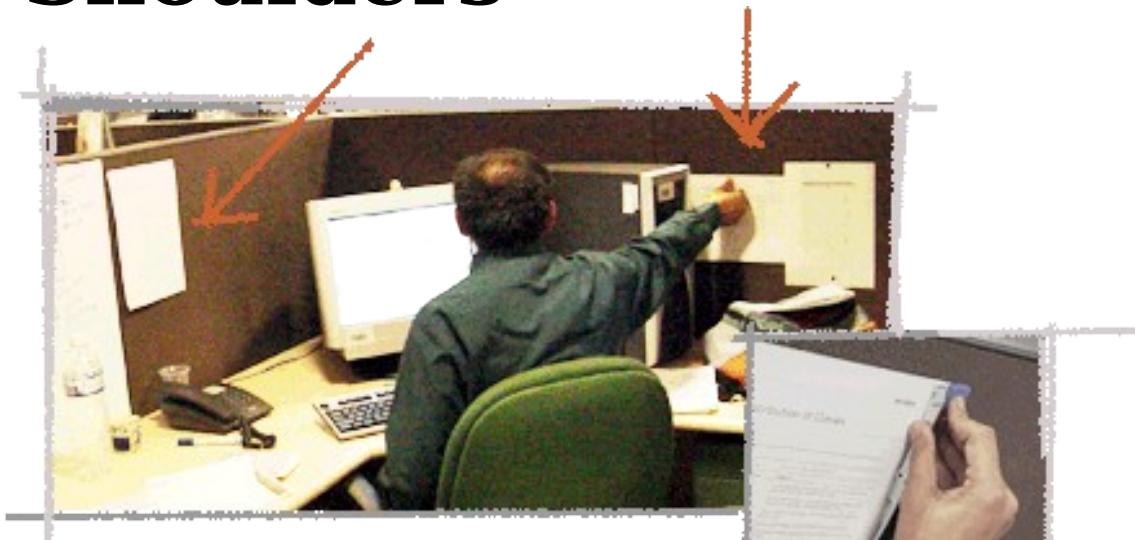
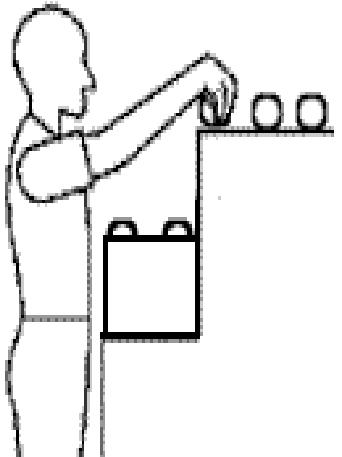


# Neck Bent More Than 30 degrees



Shortened  
muscles  
compress  
nerve

# Hands Over Head or Elbows Above Shoulders



# Recent History

- WMSDs = half of all rated military disabilities
  - one third reported civilian injuries and illnesses within the Marine Corps
- Increase in reporting WMSDs
  - Changes in work processes
  - Increased awareness

# Management Commitment and Personnel Involvement

- Partnership between all working levels is essential to prevent WMSDs
- Command emphasis and management commitment
  - Personnel involvement is essential

# Hazard Prevention and Control

- Eliminate, reduce, or control the presence of risk factors
  - Engineering controls
  - Administrative controls
  - PPE
    - DOD does not recognize back belts or wrist splints as PPE

# Engineering Controls

- Preferred mechanism for controlling ergonomic hazards
- Redesigning the work station, work methods, and tools

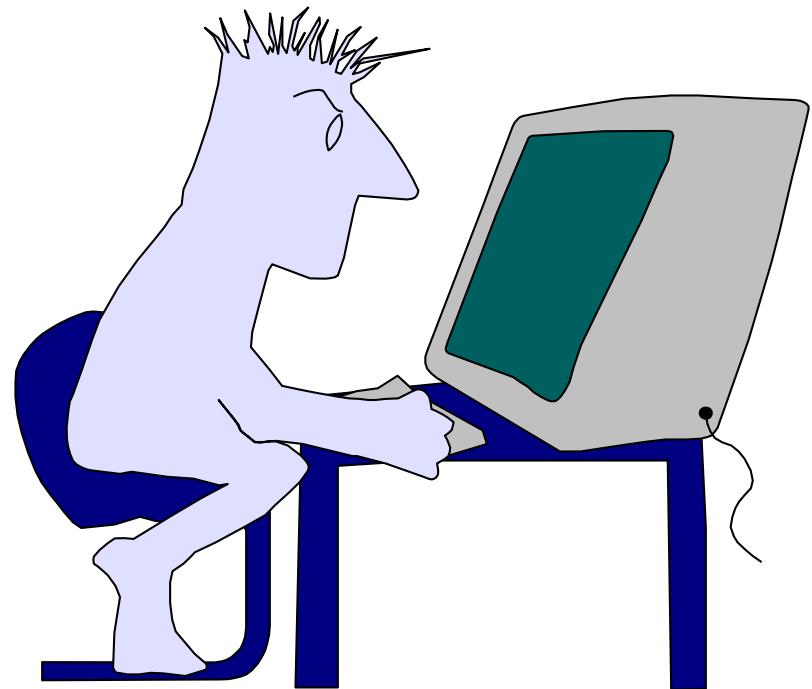


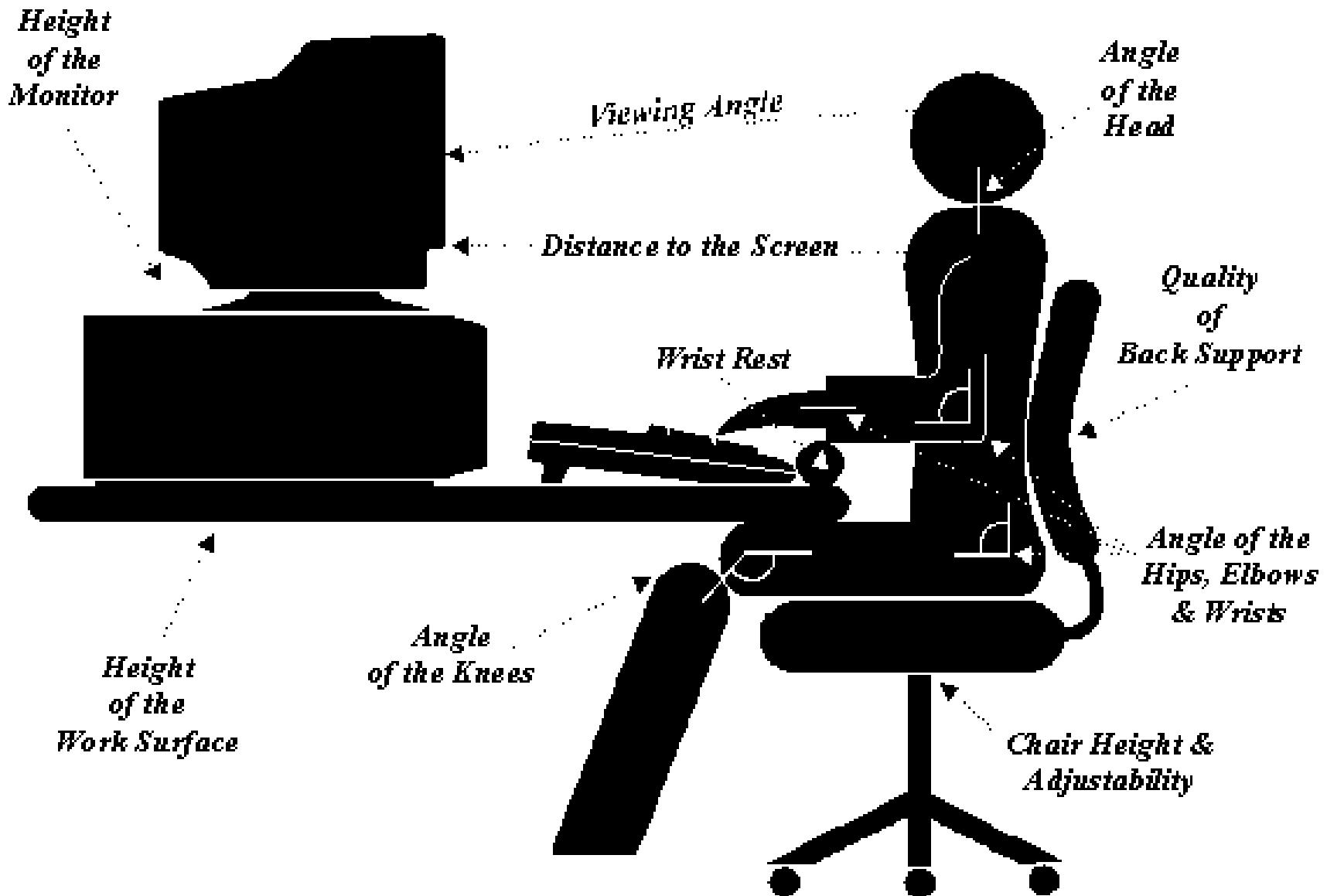
# Administrative Controls

- Rotating personnel to jobs with dissimilar physical requirements
- Establishing work/rest schedules
- Training personnel to use appropriate work methods

# Work Station Design

Workstations must be easily adjustable to accommodate the worker performing the task





# Training

- Provided to all Marine Corps personnel
- Recognize risk factors and understand procedures used to minimize the risks
- Refresher training will be provided annually or if new risks are discovered

# Training Elements

- Ergonomic definitions and concepts
- Contributing physical risk factors and personal trait
- How to recognize and report early warning signs and symptoms of WMSDs

# Training Elements cont.

- How to prevent WMSDs by recognizing risk factors and basic elements of effective design
- Wellness and Semper Fit Programs

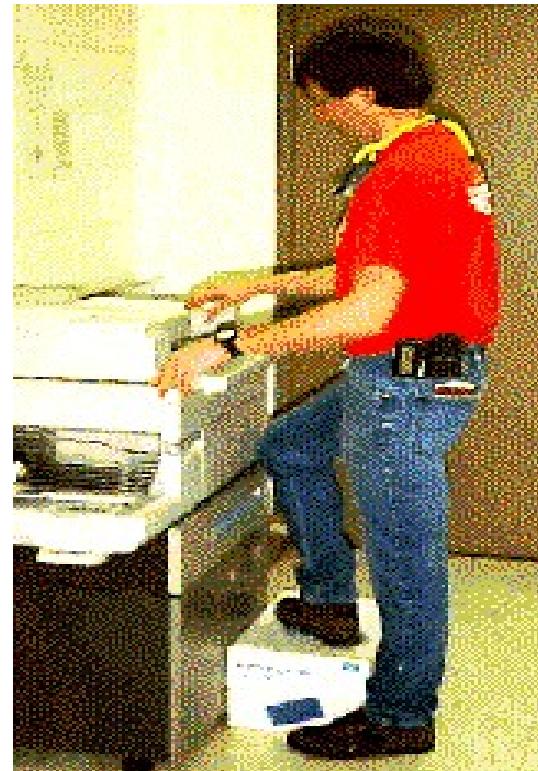
# Back Injury Training

- Anatomy and physiology
- Biomechanics of lifting
- Weight control
- How to avoid back injuries
- Physical fitness



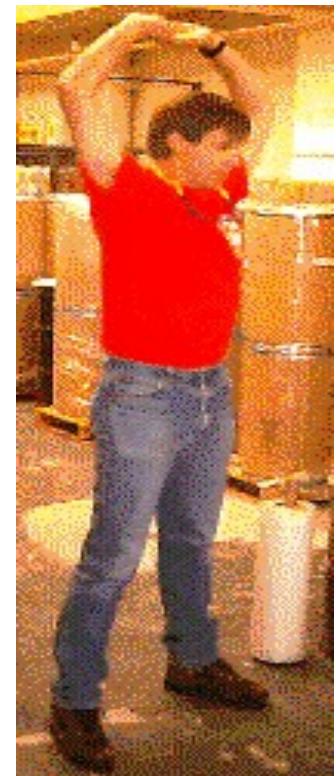
# Standing Posture

- Keep your spinal column aligned in its natural curves
- Prop one foot up on a stool



# Shift and Stretch

- Shift your posture often
- Stretch frequently
- Keep your body flexible (not rigid or fixed)
- Don't force your body to conform to its workspace



# Push not Pull

- Can you slide it instead of lifting it



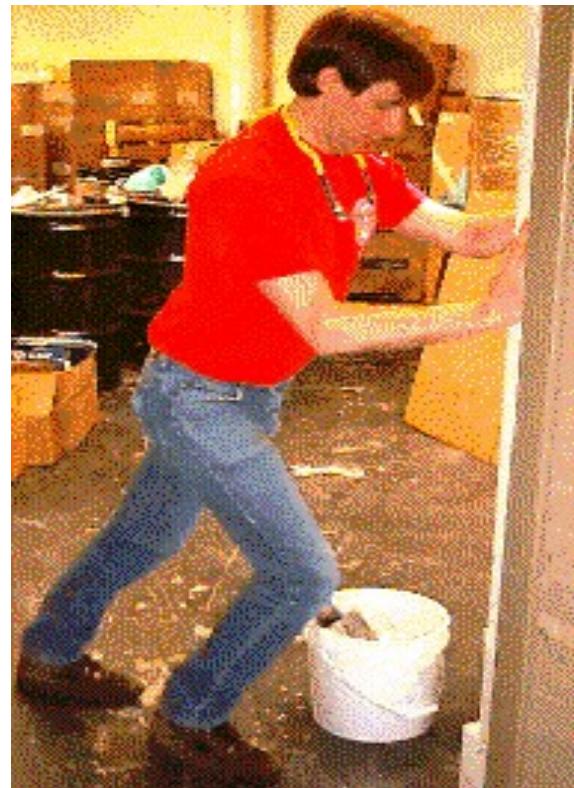
# Use Lifting Devices

- Use proper equipment
  - Hand trucks
  - Forklifts
  - Dollies
  - Use gloves if needed



# Stretch and be Ready

- Stretch your muscles or warm up before lifting
- Slip resistant shoes
- Clear a pathway before you move the item



# Lift with Your Legs

- Plant your feet firmly
  - get a stable base
- Bend at your knees - not your waist
- Tighten your abdominal muscles to support your spine



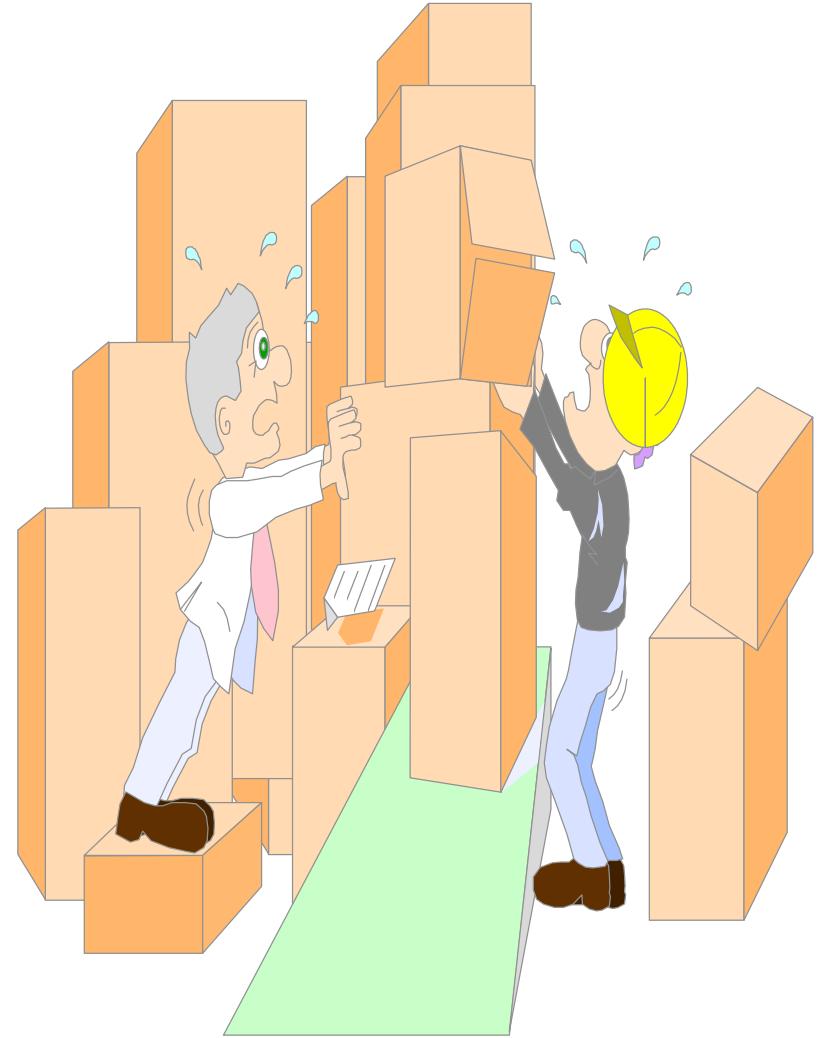
# Lift with Your Legs

## cont.

- Get a good grip - use both hands
- Keep the load close to your body
- Use your leg muscles as you lift
- Keep your back upright, keep it in its natural posture
- Lift steadily and smoothly without jerking

# Supervisors Responsibilities

- Ensure personnel receive training
- Identify and report potential risk factors
- Request assistance for managing risk factors



# Installation safety office Responsibilities

- Develop and implement an ergonomics program
- Provide training and support to tenant commands

